PROJECT TITLE : MATERIAL DEVELOPMENT
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PERIOD COVERED : January 27th - February 24th, 1981

1. TIPPING PAPER

1.1 Malaucène Micro-laser Perforated Tipping Papers "3M 0.11.6.5 and 2M 0.17"

Objective

Possible replacement of existing tipping paper on MLF-CH and MLK-CH brands with laser-type perforated tipping paper.

Summary

MLF-CH and MLK-CH cigarettes are produced with Benkert Z3/60 electro-perforated tipping paper (nominal permeability of air: 60 l/h). The perforation of the tipping paper has become visible due to deterioration of Benkert's quality. Trials have been carried out with the above mentioned papers that have a permeability of air of 66 l/h (3M 0.11.6.5) and 59 l/h (2M 0.17) to attain the same smoke deliveries as with Benkert's Z3/60. Unfortunately, the last taste evaluations made on these trials were not conclusive. New MLK-CH cigarettes with micro-laser perforated tipping papers were made and analysed.

The smoke yield results of the MLK-CH cigarettes are given in the table below:

	Malaucène 2M 0.17	Malaucène 3M 0.11.6.5	Benkert Z3/60
Date of Production	3.2.1981	3.2.1981	3.2.1981
Permeability of air l/h/4 cm	59	66	60 ± 12
Dilution % US	13 ± 2	15 ± 2	18 ± 2
CO mg/cig.	20.1	19.2	18.7
NO mg/cig.	0.29	0.29	0.28
TPM mg/cig.	21.9	21.5	19.9
DPM mg/cig.	19.4	19.2	17.9
SN mg/cig.	1.30	1.26	1.21
Puff count	9.9	9.5	9.8
HCN µg/cig.	239	229	212
Total Aldehydes mg/cig.	1.50	1.42	1.42

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Compared to the standard, the smoke yields for the trial are higher. Even if short-term variations are taken into consideration, a difference of 8% in TPM level cannot be tolerated. Comparing the standard to CIR values, the standard is within the limit of tolerances for the analytical values. On the basis of the results obtained, we prefer to repeat the trials before going any further.

1.2 Ecusta Micro-mechanically perforated Tipping Paper

Objective

Possible replacement of the existing tipping paper on MLF-CH and MLK-CH with micro-mechanically perforated tipping paper.

Summary

Ecusta submitted micro-mechanically perforated tipping paper. The first trial run on MLK-CH to substitute the existing Z3/60 tipping paper was negative: the dilution reached was low compared to the standard. We asked Ecusta to increase the permeability of air of the tipping paper. We recently received a sample of micro-mechanically perforated tipping paper at 60 l/h/4 cm. Trial runs were made with this tipping paper and compared to cigarettes made with Benkert Z3/60.

Smoke deliveries are summarized in the table below:

	Ecusta TOD-09306	Benkert Z3/60
Date of Production	3.2.1981	3.2.1981
Dilution % US	13 ± 2	18 ± 2
CO mg/cig.	19.0	18.7
NO mg/cig.	0.29	0.28
TPM mg/cig.	20.7	19.9
DPM mg/cig.	18.4	17.9
SN mg/cig.	1.25	1.21
Puff count	10.0	9.8
HCN µg/cig.	214	212
Total Aldehydes mg/cig.	1.45	1.42

Compared to the standard and CIR smoke deliveries, the trial cigarettes are within the limit of tolerances for submission for taste evaluation. We still prefer to repeat the trials and evaluate the results again before going for taste evaluation.

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2. FILTER PAPER

2.1 Schöller and Hoesch Fu-POV 40 mgl and 150 mgl

Objective

Weight saving and increase of autonomy of the bobbins on the filter rod maker.

Summary

Schöller and Hoesch developed new porous plug wraps with a substance of 20 g/m2, which have properties comparable to their usual grades with a substance of 30 g/m2. From a technical point of view, there is an advantage of less down-time on the filter rod maker: the Fu-POV 150 20 g/m2 paper will be approximately 5000 m long compared to only 3000 m for the 30 g/m2 quality, for a specified diameter of the bobbin of 580 mm. The first trials were made with Fu-POV 150 mgl on FLLPC-100 filters for machinability tests, then FLL-CH cigarettes were made with these filters and compared to standard FLL-CH cigarettes. There was no significant difference noticed on smoke deliveries and dilution, but tastewise the trial gave less impact.

Among the variants of porous plug wraps proposed in the same series was a 40 mgl Fu-POV. MLFPB-108 filters were made in order to be tested on MLF-CH cigarettes. These cigarettes were produced with the above-mentioned filters and compared to standard MLF-CH cigarettes. The smoke results and some important physical characteristics of the cigarettes are given in the table below:

	MLF-CH trial	MLF-CH control
Filter paper	Fu-POV 40 mgl	Fu-POV 40
Permeability of air "K"	42.8	40 ± 7
Filter dilution %"US"	15 ± 3	17 ± 3
Filter RTD "mm WG" (encapsulated)	55	59
Cigarette RTD "mm WG" (unencapsulated)	97 ± 5	96 ± 4
CO mg/cig.	16.8	16.1
NO mg/cig.	0.26	0.26
TPM mg/cig.	20.5	19.2
DPM mg/cig.	18.1	16.8
Puff count	8.9	8.9
HCN µg/cig.	213	189
Total Aldehydes mg/cig.	1.44	1.39

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Since no significant difference was noticed, the cigarettes were submitted for taste evaluation. The results have not yet been received. We project to organize a Panel D test (mail-out test) for further evaluation.

3. CIGARETTE PAPER

Wattens E-30179 Cigarette Paper

Objective

Reduction of CO by using cigarette paper.

Summary

Wattenspapier sent us a sample bobbin which is semi-combustible and has a permeability of air of 62 Coresta. According to the supplier, this paper can influence the Carbon Monoxide delivery of a cigarette. MLK-CH cigarettes were produced and compared to standard MLK-CH cigarettes.

The smoke delivery analysis for the cigarettes with some of the important physical cigarette parameters are given in the table below:

	MLK-CH trial	MLK-CH control
Cigarette Paper	E-30179	WP-60
Permeability of air ml/min/cm^2	62	53 ± 9
RTD of cig. "mm WG" (unencapsulated)	87	89
Filter dilution % "US"	17 ± 2	18 ± 2
CO mg/cig.	15.8	18.7
NO mg/cig.	0.27	0.28
TPM mg/cig.	20.3	19.9
DPM mg/cig.	18.1	17.9
SN mg/cig.	1.22	1.21
Puff count	9.8	9.8
HCN µg/cig.	177	212
Total Aldehydes mg/cig.	1.45	1.42

We noticed a substantial reduction (15%) of CO compared to the control. But comparing the CO value of the trial to the CO value in the CIR, there is no appreciable decrease. A second CO determination of the control has given the result of 15.8 mg/cig. On the basis of the contradictory results of the control, we decided to repeat the test. A final report will be established on this subject as soon as results are available.

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4. NEW FILTRATION MATERIAL

Eastman 3.3/44.000 Y and 2.5/40.000 Y Tows

Objective

2.5/40.000 Y and 3.3/44.000 Y tow evaluation. Possible replacement of existing 3.4/46.000 I by these items.

Summary

In September 1980, Eastman submitted a 3.3/44.000 Y tow similar to the type used in PM-USA. The first test run on the "capability" of this tow was not conclusive. In the meantime, PM-USA changed the lot number, so we ordered a new bale similar to the type PM-USA is now using. At the same time, Eastman proposed a 2.5/40.000 Y tow which would have the same performance as the 3.4/46.000 I from the point of smoke retention. A sample of 2.5/40.000 Y was ordered for tests.

On 23rd January 1981, trial runs on a KDF II rod maker were made without any difficulty with the tow items mentioned above. The items were evaluated on the basis of "capacity curve". The "capacity curve" of a tow is always established for a given length and diameter of filter rods by measuring the extreme RTD that can be achieved without any plasticizer application. Then the filter rods produced at the extreme points are weighed. By plotting RTD vs weight, a capacity curve is established. For the establishment of "capacity curves", 108 x 7.86 mm rods were made. The resulting curves are reported in Fig. 1. From Fig. 1 for 375 mm RTD level, an economy of 5% in cellulose acetate can be achieved by using 3.3/44.000 Y tow instead of 3.4/46.000 I tow. This economy is 15% for the tow item 2.5/40.000 Y.

Once the capacity curve was established, filter rods with plasticizer were produced. The characteristics of the filter rods made are given in the table below.

Tow item	2.5/40.000 Y	3.3/44.000 Y
Rod length "mm"	108	108
Rod Ø "mm"	7.89 ± 0.02	7.89 ± 0.02
Filter Plug Wrap	Fu-POV 40	Fu-POV 40
Filter Rod RTD "mm WG"	361 ± 13	388 ± 12
Plasticizer %	10	10
Filter Rod Weight "mg"	768 ± 6	856 ± 7

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In order to test the efficiencies of the filters produced, we made MLF-CH cigarettes. The smoke yield results and efficiencies are given in the table below:

Tow item	2.5/40.000 Y	3.3/44.000 Y	Control 3.4/46.000 I
Tobacco weight at 12% MC "mg"	790	783	772
RTD cig. "mm WG" (unencapsulated)	85	87	86
RTD filter tip "mm WG" (encapsulated)	58	61	60
Filter dilution % US	17 ± 2	17 ± 2	17 ± 2
Filter efficiency %	44	43	44
CO mg/cig.	17.1	16.4	15.8
NO mg/cig.	0.27	0.25	0.24
TPM mg/cig.	19.3	19.7	19.8
DPM mg/cig.	16.9	17.3	17.5
SN mg/cig.	1.14	1.16	1.13
Puff count	9.2	9.1	8.9
HCN µg/cig.	199	189	183
Total Aldehydes mg/cig.	1.26	1.28	1.35

Comparing the items to the control, no significant variations of smoke deliveries can be pointed out. The cigarettes will now be submitted for taste evaluation and at the same time a Panel D test (mail-out test) will be organised.

E. Erkohen
Material Development

ELE/nod 2.3.81

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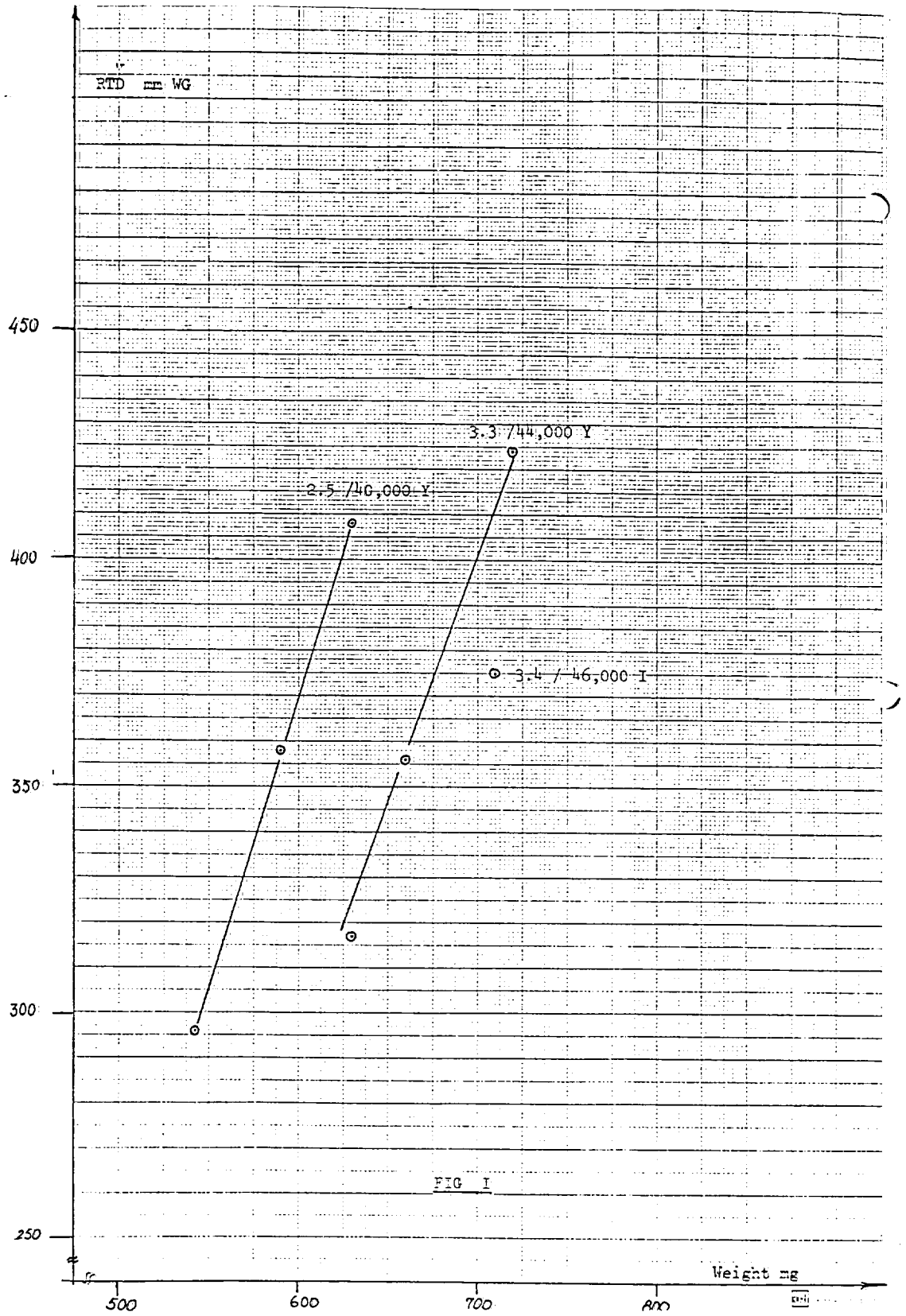

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